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UNIVERSITY OF BAHRAIN  
DEPARTMENT OF COMPUTER SCIENCE  
ITCS241: Assembly Language Programming

FACULTY OF INFORMATION TECHNOLOGY  
SEMESTER I – 2004/2005  
First Test Date: NOV 9, 2004

Question #	1	2	3	4	5	6	7	8	9	10	11
Answer											

**QUESTION ONE:** Choose the correct answer for each of the following questions (1 ...11) and write it down in the above table { 11 x 1 = 11 points}

- 1) MOV AX, 205H  
MOV BX, 5608H  
DIV BL

a) AX=0540H      b) AX=4005H      c) AX=1225H      d) AX=2512H      e) None

- 2) MOV AX, 3A80H  
MOV BX, 4F40H  
MUL BL

a) AX=3200H      b) AX=2000H      c) AX=0E80H      d) AX=2780H      e) None

- 3) MOV AX, A7H  
MOV CX, 50H  
MOVSX AX, AL  
IDIV CL

a) AX=F7FFH      b) AX=F701H      c) AX=0901H      d) AX=0701H      e) None

- 4) MOV AX, 90H  
MOVSX AX, AL  
MOV DL, 30H  
IMUL DL

a) AX=2700H      b) AX=EB00H      c) AX=DE00H      d) AX=2100H      e) None

- 5) The addressing mode used in the instruction: XCHG [BX], AL is \_\_\_\_\_  
a) Indexed      b) Direct      c) Immediate      d) Indirect      e) None

- 6) The addressing mode used in the instruction: SUB MY [BX], AL is \_\_\_\_\_  
a) Indexed      b) Direct      c) Immediate      d) Based indexed      e) None

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- 7) The 8-bit value 1100 0011 represents unsigned decimal value \_\_\_\_\_ and signed decimal value \_\_\_\_\_.  
 a) 195, -195      b) 195, +61      c) 195, -61      d) c3, -43      e) None
- 8) The range of signed numbers that can be stored in a word of 10 bits is from \_\_\_\_\_ to \_\_\_\_\_.  
 a) -1024, +1024      b) -512, +512      c) -1024, +1023      d) -512, +511      e) None
- 9) In a machine with 20 address lines and 24 data lines, the maximum size of directly addressable main memory is \_\_\_\_\_ Mbytes.  
 a) 1      b) 16      c) 8      d) 144      e) None
- 10) In instruction cycle, the \_\_\_\_\_ step determines the required actions and instruction size.  
 a) Instruction Fetch      b) Decode      c) Execute      d) Operand Fetch      e) None
- 11) The file "Bahrain.lst" can be generated by the \_\_\_\_\_ program.  
 a) LINK      b) MASM      c) DEBUG      d) Operating System      e) None

QUESTION TWO: Study carefully the following code and answer the following questions (12 ...16):  
 { 5 x 1 = 5 points}

```
.data
TST WORD 3F2CH, 25FFH, 7A8BH, 4924H, 0F97EH
WORD 7000H, 6000H, 5588H, 0FFFAH, 0C100H
V9 WORD ?

.code
MOV SI, OFFSET TST
MOV AX, LENGTHOF TST
MOV BX, 4
MOV V9, SIZEOF TST
MOV SI, V9
SUB SI, TYPE TST
MOV DI, TST[BX]
MOV DX, TST[SI]
```

- 12) After executing the above code, AX register will contain \_\_\_\_\_ H.
- 13) After executing the above code, SI register will contain \_\_\_\_\_ H.
- 14) After executing the above code, DX register will contain \_\_\_\_\_ H.
- 15) After executing the above code, DI register will contain \_\_\_\_\_ H.
- 16) After executing the above code, V9 variable will contain \_\_\_\_\_ H.

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QUESTION#1: Answer each of the following questions as indicated:

[7 points]

- a) Give no more than 2 instructions to subtract  $M4 = M4 - M3$ ; where  $M3, M4$  are defined memory doublewords

\_\_\_\_\_  
\_\_\_\_\_

- b) Give no more than 3 instructions to subtract  $L3 = L3 - 2 * L4$ , where  $L3, L4$  are defined memory words.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- c) Give 1 directive to define an array named `ITCS241` consisting of 1024 elements (each is 8 bytes), each is initialized with `33FFh` value.

- d) Give no more than 1 instruction to sub the value `48FFh` from the memory word pointed by `ESI` register.

\_\_\_\_\_

- e) Give no more than 2 instructions to store the value `6500h` in `FS` register.

\_\_\_\_\_  
\_\_\_\_\_

QUESTION#2: Fill in blanks as required

[10 points]

- a) Labels used in assembly programs are of 2 types: \_\_\_\_\_ and \_\_\_\_\_

- b) The assembler accepts as input a \_\_\_\_\_ program and produced as output an \_\_\_\_\_ program.

- c) The range of signed numbers that can be stored in ONE WORD is from \_\_\_\_\_ to \_\_\_\_\_.

- d) The unsigned numbers represented using 12 bits range between \_\_\_\_\_ and \_\_\_\_\_.

- e) The value  $(11101000)_2$  represents a signed number ( \_\_\_\_\_ )<sub>10</sub>, and unsigned number ( \_\_\_\_\_ )<sub>10</sub>.

- f) In real mode, if the address of the first byte in a segment is `4FFC0`, then the segment last word address is \_\_\_\_\_ H.

- g) In addition to an `obj` file, the `MASM` produces 2 files: \_\_\_\_\_ and \_\_\_\_\_.

- h) An assembly program contains 2 types of statements: \_\_\_\_\_ and \_\_\_\_\_.

\_\_\_\_\_

QUESTION#3:

[7 points]

Study carefully the following data definitions and answer the next 5 questions:

```
C1 equ "F"
D1 DB 4 DUP(C1, -128)
M1 dd 0AA88H, 77FF55H
a3 DW 3acfh, -9, ?
```

[ 7 points ]

QUESTION#1: Answer each of the following questions as indicated:

- Give no more than 2 instructions to subtract  $M4 \leftarrow M4 - M3$ , where  $M3, M4$  are defined memory doublewords.  
\_\_\_\_\_
- Give no more than 3 instructions to subtract  $L3 \leftarrow L3 - 2 * L4$ , where  $L3, L4$  are defined memory words.  
\_\_\_\_\_  
\_\_\_\_\_
- Give 1 directive to define an array named ITCS241 consisting of 1024 elements (each is 8 bytes), each is initialized with 33FFh value.  
\_\_\_\_\_
- Give no more than 1 instruction to sub the value 48EFh from the memory word pointed by ESI register.  
\_\_\_\_\_
- Give no more than 2 instructions to store the value 6500h in FS register.  
\_\_\_\_\_  
\_\_\_\_\_

[10 points]

QUESTION#2: Fill in blanks as required

- Labels used in assembly programs are of 3 types: \_\_\_\_\_ and \_\_\_\_\_
- The assembler accepts as input a \_\_\_\_\_ program and produced as output an \_\_\_\_\_
- The range of signed numbers that can be stored in ONE WORD is from \_\_\_\_\_ to \_\_\_\_\_
- The unsigned numbers represented using 12 bits range between \_\_\_\_\_ and \_\_\_\_\_
- The value  $(11101000)_2$  represents a signed number ( \_\_\_\_\_ )<sub>10</sub> and unsigned number ( \_\_\_\_\_ )
- In real mode, if the address of the first byte in a segment is 4FFC0, then the segment last word address is \_\_\_\_\_ H.
- In addition to an obj file, the MASM produces 2 files: \_\_\_\_\_ and \_\_\_\_\_
- An assembly program contains 2 types of statements: \_\_\_\_\_ and \_\_\_\_\_

[ 7 po

QUESTION#3:

Study carefully the following data definitions and answer the next 5 questions:

```

C1 equ  "F"
D1 DB  4 DUP(C1, -128)
M1 dd  0AA88H, 77FF55H
a3 DW  3acfh, -9, ?

```